

CHAPTER 6 RCWM DETECTION, REMOVAL AND COMPLETION

6-1. Introduction. This chapter provides information on the RCWM removal process and project completion procedures.

6-2. Removal Design.

a. The USAESCH OE Design Center is responsible for the removal design in coordination with the PM.

b. Instead of completing a formal removal design, USACE typically performs the tasks associated with removal design during the development of the SOW and Safety Submission for the removal action. The level of detail for the removal design phase is dependent on the complexity of the work to be performed and the type of contract to be utilized.

c. The purpose of the removal design process is to describe the technical details of how the removal action will be performed. The removal design process includes the following components, which are illustrated in Figure 6-1 and discussed below:

(1) Preparation of the removal action SOW and IGE. The USAESCH OE Design Center is responsible for executing and approving the OE removal action SOW and IGE. SOW and IGE quality excellence will be accomplished through the conscientious, cooperative efforts of each design team member. The district reviews the SOW and IGE and provides comments. Additional information on the SOW and IGE are provided in EP 1110-1-18.

(2) A site visit to gather additional information on the nature and extent of contamination at the site may be required. The site visit is conducted to provide the contractor with the opportunity to gather pertinent information for use in preparing the cost estimate and project planning documents. Detailed information on the site visit is provided in EP 1110-1-18.

(3) The preparation of planning documentation (e.g., Safety Submission) and completion of all coordination tasks prior to the Notice-to-Proceed will be necessary for the removal action. A Safety Submission is required when anomaly avoidance is not used for removal activities or the suspect item cannot be detected. The Safety Submission will be prepared and approved in accordance with the requirements found in Chapter 7 of this pamphlet. An outline of the Safety Submission may be found on the OE MCX website at <http://www.hnd.usace.army.mil/oew/policy/dids/didindx.html> under DID OE-060.

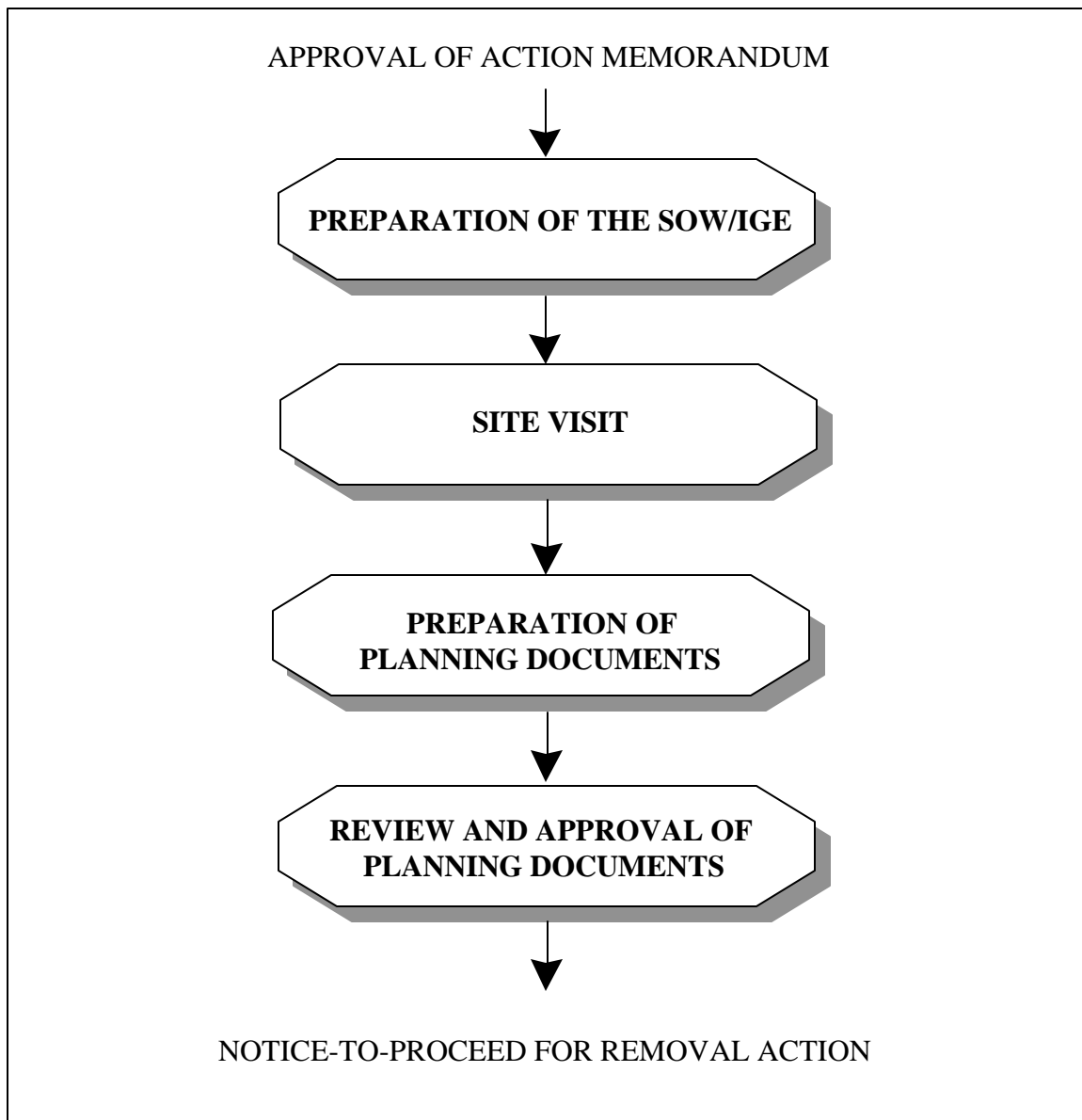


Figure 6-1. Removal Design Process

6-3. RCWM Detection and Removal.

a. Introduction. The RCWM Removal phase begins following the receipt of the Notice-to-Proceed. The removal action is intended to permanently and comprehensively address both short and long-term health and safety hazards at RCWM contaminated sites. The removal action may be implemented using active duty military personnel, DOD civilian personnel, private contractors, or a combination of the three. The implementing agency will be responsible for full coordination for all activities, including procurement, funding, scheduling, and authorizations. The removal action phase is composed of the following tasks, which are illustrated in Figure 6-2 and discussed in paragraphs 6-3b through 6-3i.

b. Location Surveys and Mapping. Location surveys and mapping will be performed by the UXO contractor to establish boundaries of the areas under investigation. The procedures for the execution of location surveys and mapping are discussed in EM 1110-1-4009.

c. Area Preparation.

(1) Prior to the initiation of a RCWM removal action, brush clearance may be required. The purpose of brush clearance is to reduce or remove the vegetative growth from the work areas in order to effectively locate, investigate, and remove surface and subsurface RCWM.

(2) The areas cleared and techniques used must be coordinated with the district environmental staff and documented in the Work Plan. A UXO Technician II must always escort the brush clearing crew in areas not previously cleared of OE. The safety requirements in EM 385-1-1 must be followed. PPE will be provided to the brush clearance crew and used as required for protection. All brush clearance personnel must be trained in the safe operation of the equipment and must have obtained site-specific safety training in accordance with Chapter 8 of this document.

d. RCWM and Chemical Agent Contaminated Media Surface Removal. RCWM surface removals are conducted to remove all RCWM from the surface of the work area. UXO-qualified personnel will flag, identify, and record the approximate location of all suspect RCWM items. TEU is responsible for assessing the item, packaging and transporting the item to the IHF in accordance with the approved Safety Submission. The contractor will assist TEU as needed. In addition, the contractor will perform environmental sampling in accordance with Chapter 9 of this document to verify that no residual chemical agent contamination remains after the removal of all suspect RCWM items. Also, the contractor will remove all chemical agent contaminated scrap and non-RCWM related materials that may interfere with the geophysical investigation and store them for later disposition.

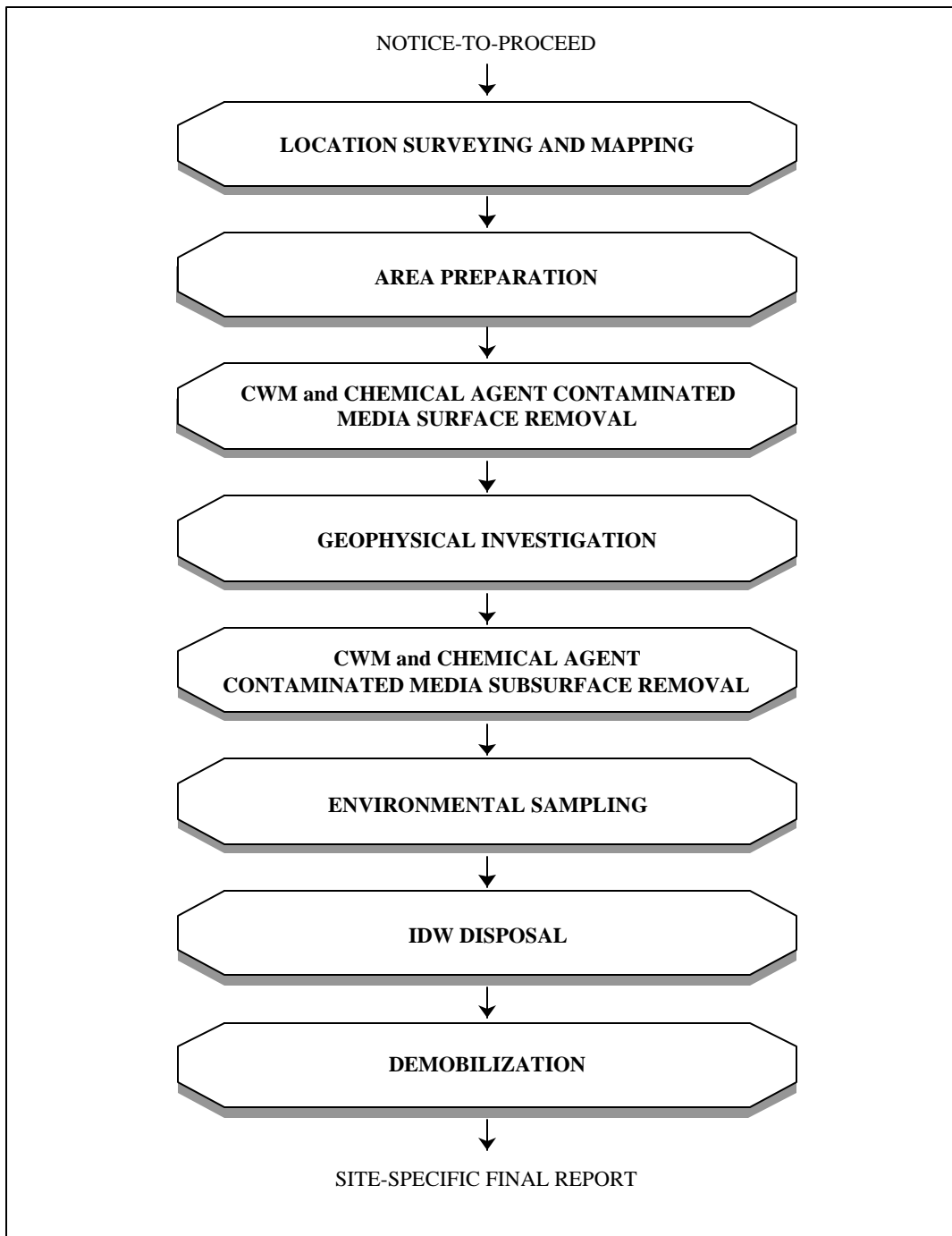


Figure 6-2. Removal Action Process

e. **Geophysical Investigation.** The purpose of the geophysical investigation is to acquire geophysical data and identify all anomalies that resemble UXO/OE. Geophysical investigations may be completed using detection equipment with real time or post-processing discrimination techniques. The latter requires the collection and recording of geophysical data that is subsequently processed by commercial software to identify electronic signals representative of anomalies. All anomalies selected for excavation will be mapped, documented on dig-sheets, physically re-established by survey methods, and marked for investigation. Information on the elements, which must be considered when planning and executing a geophysical investigation, is provided in EM 1110-1-4009.

f. **RCWM and Chemical Agent Contaminated Media Subsurface Removal.**

(1) Intrusive activities are conducted to investigate and identify the source of each subsurface anomaly. Anomalies deeper than 12 inches may be excavated using mechanical or manual methods. Only approved UXO personnel will perform excavations. All excavations will be performed in accordance with the provisions of 29 CFR 1926, subpart P.

(2) After the probable source of the subsurface anomaly is removed, the excavation will be rechecked with a magnetometer or other ordnance detector prior to backfilling. If the location does not produce another anomaly upon the recheck, then the excavated area will be backfilled and restored in accordance with contract requirements. If a suspect RCWM item is uncovered, TEU will assess the item, package and transport the RCWM item in accordance with the approved Safety Submission. The contractor will assist TEU as needed. In addition, the contractor will perform environmental sampling in accordance with Chapter 9 of this document to verify that no residual chemical agent contamination remains after the removal of all suspect RCWM items. Also, when possible, the contractor will remove all chemical agent contaminated media and store for later disposition.

(3) **Evacuations.** Evacuations are sometimes necessary when conducting intrusive investigations in order to minimize the risk of the operation. The NOSE distance based on the MCE is calculated to ensure that the public are outside of that distance during the conduct of the excavation. Implementing engineering controls can reduce the NOSE distance. The use of engineering controls is discussed in Chapter 5 of this document.

(4) **Other considerations.** There are several other considerations, which must be accounted for during the intrusive investigation, including: air monitoring, exclusion zone management, and quality assurance. These topics are discussed in detail in later chapters of this document.

(5) **Conventional fragmentation distance.** When determining which fragment range to use, the following guidelines should be followed. If the identification of the OE expected at the site is unknown, the default distances listed in Chapter 4, paragraph C5.5.4, DOD 6055.9-STD will be used. If it is not practical to use these default distances and the identification of the OE expected at the site is known,

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then the maximum fragment throw range calculated in accordance with HNC-ED-CS-S-98-1, Methods for Predicting Primary Fragmentation Characteristics of Cased Explosives, will be used. The item with the maximum fragment distance will become the MPM for the site. For unintentional detonations, the project team may request approval from the USAESCH OE Safety Branch to use the range to no more than one hazardous fragment per 600 square feet (1/600 distance) calculated in accordance with HNC-ED-CS-S-98-2, Methods for Calculating Range to No More than One Hazardous Fragment per 600 Square Feet, in lieu of the maximum fragment throw range. The maximum fragment distances and the 1/600 distances will be calculated by the USAESCH Structural Branch and provided to the PM.

(6) The public evacuation distance is the greater of the NOSE or the conventional fragmentation distance, taking into consideration reduction of either of these distances due to the use of engineering controls.

g. IDW Disposal. IDW will be characterized and disposed of in accordance with Chapter 10.

h. Demobilization.

(1) Demobilization may occur for a variety of reasons, including:

(a) The project may be completed with all work accomplished.

(b) The project may be incomplete, but the contractor has expended most of the contract funds.

(c) Adverse weather conditions.

(d) Determination that continuing in the present course of action is not in the best interest of the government.

(2) A demobilization plan will be developed by the contractor in close coordination with the PMNSCM, TEU, PM, USAESCH OE Design Center, OE Safety Specialists, and the customer. Authorization to demobilize from a site must be issued in writing to the contractor from the CO. The following areas should be addressed in the demobilization plan:

(a) Arrangements for periodic maintenance and monitoring for the IHF.

(b) Arrangements for closing out the IHF and shipping back to PMNS.

(c) Disposal of RCWM scrap (if necessary).

(d) Disposal of conventional scrap (if necessary).

(e) Storage and transport of 3X contaminated equipment (if necessary).

- (f) Disposal or transfer of remaining explosives (if necessary).
- (g) Disposition of commercial explosive storage containers (if necessary).
- (h) Close down of Command Post facilities.
- (i) Disposition of GFE (if necessary).
- (j) Disposition of portable sanitary facilities (if necessary).
- (k) Shutting down of public utilities at the project site (i.e., water, electrical).

i. **Site Specific Final Report.** At the completion or termination of a RCWM removal action, the contractor will prepare and submit a Site Specific Final Report. The Site Specific Final Report documents all activities and operations that occurred and lists the RCWM found during the removal action. This report is used as the basis for USACE's recommendations for future land use and for any proposed restrictions on the cleared area. EP 1110-1-18 discusses the required content and submittal procedures for the Site Specific Final Report.

6-4. **Project Completion.** The project completion requirements for a RCWM removal action are discussed in EP 1110-1-18. Since the USAESCH OE Design Center executes the RCWM response action, the requirements for completion of an OE removal action executed at a FUDS by an OE Design Center, as discussed in EP 1110-1-18, are applicable to RCWM projects.

6-5. **Operations and Maintenance (O&M).** The purpose of O&M activities is to ensure that appropriate site safety and security measures remain in place and to maintain the integrity of any site controls, such as fences and signs. The determination of appropriate safety and security measures site controls must be made on a case-by-case basis. The district is responsible for ensuring that appropriate O&M activities are in place. Additional information on O&M related issues, such as recurring reviews, recordkeeping and access restrictions are discussed in EP 1110-1-18.